

Appendix F - Annual Technology Investment and Project Reviews

Post Implementation Review

The post implementation review must document practices and procedures that lead to project successes and make recommendations for applying them to similar future projects, and make recommendations for improving the planning, management, and quality control of future, similar investments or projects. It should assess the causes and impacts of any significant reductions in benefits, increases in one-time or continuing costs, problems with project management, or increases in project risk during the course of the project.

Purpose

The major purpose of a Post Implementation Review (PIR) is to determine if the expectations established for an information technology system were met. The PIR essentially documents the comparison between the *actual* results of a system and the *estimates* contained in the acquisition plan or project agreement. It also establishes a baseline for similar acquisitions or projects to assist in shaping more accurate estimates for future information technology planning so that state agencies can benefit from experience. Ideally, the PIR should be conducted by an objective third party such as a private contractor, the State Auditor's Office, internal auditor, or other neutral party.

Scope

The PIR complements previous project documentation. It is not a requirement to provide the level of detail which may be found in the agency's project definitions, decisions packages, conceptual/detailed design, and feasibility study. What is sufficient – and necessary – is the level of detail that will enable meaningful analysis of events, and conclusions to be drawn regarding those events.

The comparisons of interest in a PIR are:

- Estimated and actual schedule;
- Estimated and actual costs;
- Expected and actual functionality;
- Projected and actual benefits.

Guidance

It is vital that the PIR include what is perceived to have occurred, and why. However, it is recognized that not all events are explainable in terms of measurable "cause and effect" rationale, yet there may be "lessons learned" in the perception of events even though the "measurement" cannot be ascertained. Also, there can be valid reasons why costs – for example – have increased, such as an expansion of the system's original functional requirements or an increase in technical staffing.

"Knowns" (e.g., acquisition costs, personnel, schedule) are traditionally tracked because the information is available. However, a particular project's "unknowns" (during development) can create implementation risks, and it is these unknowns which can in hindsight offer valuable lessons for project lifecycle planning (e.g., additional functionality added, training, maintenance of new code, unforeseen additional personnel or technical skills needed.)

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In addition to a value expressing differences such as “cost was *X* dollars over estimates,” it is also useful to express differences in terms of percentages when comparing estimates with actuals since it lends insight into the project’s complexity. For example, a greater percent difference – 10% above cost estimates – may be more acceptable for an innovative, higher-risk project than for a project with lower risk since the latter should have less uncertainty in performance information. The following are some points to consider when addressing schedule, costs, functionality, and benefits of the completed project.

a) *Schedule*: The PIR should describe the original and actual milestones, deliverables, products, or processes effected and the reasons for any significant differences. For example, the trade-off between elapsed time and the desire for rigorous functional requirements could affect critical paths and thus, delivery dates. If a project missed a schedule by two months, this information by itself is not sufficient for the PIR. Since a task that takes longer sometimes results in a better system, schedule aspects of the PIR must make clear whether schedule changes were due to engineering necessity, uncertainty, assumptions during estimation, or other reasons.

b) *Costs*: Project costs should be categorized to illustrate whether savings or overruns occurred as a result of software design, hardware changes, additional personnel, or other combination of factors. For example, the estimated (original) cost may be lower than the actual cost because the estimate did not include subsequent changes to the specifications. Or a particular technology did not turn out to be as mature as anticipated requiring other hardware or software solutions. What is important is to capture the reasons for differences between the estimated and actual costs, and what the specific cost categories were that contributed to the differences.

c) *Functionality*: The comparison between expected and actual functionality essentially addresses project technical feasibility in two ways: (a) does it meet specification, and (b) does it work satisfactorily?

Technical specifications are addressed via requirements analysis (during the project life cycle), and may be derived from agency, state, federal, and industry (de facto) standards. The PIR should address whether technical requirements were sufficient to fully realize the required – and desired – functionality of key hardware and software components of the system, and of the system as a whole. The point is to discuss whether the system works as *specified*.

The PIR should also address whether the system works as *intended* by management and/or users. If it does not, this may be due to insufficient requirements, engineering trade-off, cost, complexity of the technical problem, etc. These reasons need to be captured because they indicate that some technical specifications may need to be tightened, or that they need to be used in combination with other factors. Comments from system users are a critical part in establishing whether the system really works as intended: if there is no user support, the positive aspects of meeting specification are diluted.

d) *Benefits*: The benefits section is not a repetition of the agency’s cost/benefit analysis. Since the project was funded through implementation, it is assumed that there were projected benefits. Rather, the PIR documents whether the projected benefits match the actual benefits as a result of the project’s implementation. Benefits need not be defined in

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terms of cost savings or cost avoidance. They may include “public good” (e.g., enhanced safety), increased agency throughput for workload, enhanced agency capability for additional responsibilities, future potential of the system or agency, consistency with the technical direction of the state, agency, and industry, or lessons learned by the agency in meeting its technical goals.

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